GCSE
MATHEMATICS

New Specimen Papers published June 2015
Paper 3 Foundation – Mark Scheme

8300/3F

Version 1.0

Principal Examiners have prepared these mark schemes for specimen papers. These mark schemes have not, therefore, been through the normal process of standardising that would take place for live papers.

Further copies of this Mark Scheme are available from aqa.org.uk

Glossary for Mark Schemes

GCSE examinations are marked in such a way as to award positive achievement wherever possible. Thus, for GCSE Mathematics papers, marks are awarded under various categories.

If a student uses a method which is not explicitly covered by the mark scheme the same principles of marking should be applied. Credit should be given to any valid methods. Examiners should seek advice from their senior examiner if in any doubt.

M	Method marks are awarded for a correct method which could lead to a correct answer.
A	Accuracy marks are awarded when following on from a correct method. It is not necessary to always see the method. This can be implied.
B	Marks awarded independent of method.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special case. Marks awarded within the scheme for a common misinterpretation which has some mathematical worth.
M dep	A method mark dependent on a previous method mark being awarded.
B dep	A mark that can only be awarded if a previous independent mark has been awarded.
oe	Or equivalent. Accept answers that are equivalent. eg accept 0.5 as well as $\frac{1}{2}$
[*a*, *b*]	Accept values between *a* and *b* inclusive.
3.14 …	Accept answers which begin 3.14 eg 3.14, 3.142, 3.1416
Use of brackets	It is not necessary to see the bracketed work to award the marks.

Examiners should consistently apply the following principles

Diagrams

Diagrams that have working on them should be treated like normal responses. If a diagram has been written on but the correct response is within the answer space, the work within the answer space should be marked. Working on diagrams that contradicts work within the answer space is not to be considered as choice but as working, and is not, therefore, penalised.

Responses which appear to come from incorrect methods

Whenever there is doubt as to whether a student has used an incorrect method to obtain an answer, as a general principle, the benefit of doubt must be given to the student. In cases where there is no doubt that the answer has come from incorrect working then the student should be penalised.

Questions which ask students to show working

Instructions on marking will be given but usually marks are not awarded to students who show no working.

Questions which do not ask students to show working

As a general principle, a correct response is awarded full marks.

Misread or miscopy

Students often copy values from a question incorrectly. If the examiner thinks that the student has made a genuine misread, then only the accuracy marks (A or B marks), up to a maximum of 2 marks are penalised. The method marks can still be awarded.

Further work

Once the correct answer has been seen, further working may be ignored unless it goes on to contradict the correct answer.

Choice

When a choice of answers and/or methods is given, mark each attempt. If both methods are valid then M marks can be awarded but any incorrect answer or method would result in marks being lost.

Work not replaced

Erased or crossed out work that is still legible should be marked.

Work replaced

Erased or crossed out work that has been replaced is not awarded marks.

Premature approximation

Rounding off too early can lead to inaccuracy in the final answer. This should be penalised by 1 mark unless instructed otherwise.

Q	Answer	Mark	Comments
1(a)	9	B1	
1(b)	6	B1	
2	C	B1	
3	27	B1	
4	7500 – 1875 or 5625	M1	
	their 5625 ÷ 36	M1	
	156.25	A1	
5	(120 + 80) ÷ 4 or 200 ÷ 4 or 50	M1	
	120 ÷ 3 or 40	M1	
	their 50 – their 40 or 10	M1dep	dependent on at least M1
	$\frac{10}{80}$ or $\frac{1}{8}$	A1	oe fraction
6(a)	Box A → P(3) = $\frac{1}{6}$ and Box B → P(3) = $\frac{1}{3}$ and Box C → P(3) = $\frac{2}{5}$ and Box D → P(3) = $\frac{2}{4}$ or $\frac{1}{2}$	M1	Allow one incorrect probability
	(Box) D and all probabilities correct	A1	
6(b)	(Box) A and (Box) B	B1	

Q	Answer	Mark	Comments
7(a)	240 – 87.5(0) or 152.5(0)	M1	
	152.50	A1	
7(b)	**Alternative method 1**		
	120 – 87.5(0) or 32.5(0)	M1	
	No and 152.5(0) $\neq 2 \times 32.5(0)$	A1ft	oe ft part (a)
	Alternative method 2		
	152.5(0) ÷ 2 + 87.5(0) or 163.75	M1	
	No and 163.75	A1ft	oe ft part (a)
8	5×7 (+) 9×-2 or 35 or 18	M1	
	17	A1	
9	(–2, 3) and (2, 1)	B2	B1 (–2, 3) or (2, 1) or (–2, 3) and (2, 1) correctly plotted SC1 (3, –2) and (5, 2) or (–5, 2) and (–3, 6)

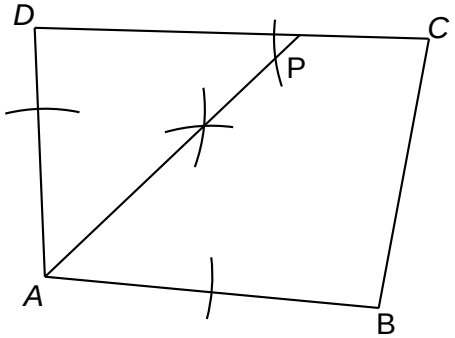
Q	Answer	Mark	Comments
10(a)	(10, 20.8), (20, 21.6), (30, 22.4) and (40, 23.2) plotted	B1	
	Straight line through their points	B1ft	ft line of best fit following plotting error
10(b)	[19.9, 20.1]	B1	
10(c)	**Alternative method 1**		
	21.2 or 22.8	M1	
	1.6	A1ft	ft their graph
	Alternative method 2		
	(20.8 + 21.6) ÷ 2 or 21.2 or (22.4 + 23.2) ÷ 2 or 22.8	M1	
	1.6	A1	
	Alternative method 3		
	23.2 – 21.6 or 22.4 – 20.8 or 21.6 – 20 or (22.4 – 21.6) × 2 or (23.2 – 22.4) × 2	M1	Finds the difference for any two masses 20 kg apart or Doubles the difference for any two masses 10 kg apart
	1.6	A1	

Q	Answer	Mark	Comments
11(a)	6, 9, 12, 15 or difference of 3 or 3n or 2n seen	M1	
	(n +) 2n + 3 or 3n + 3 or 3(n + 1) or 3 × 100 + 3	M1dep	oe
	303	A1	
11(b)	× 2 + 3	B1	

12(a)	$\frac{1}{3.5}$	M1	
	$\frac{2}{7}$	A1	oe fraction
12(b)	**Alternative method 1**		
	120 000 × (1 + 2.5)	M1	
	420 000	A1	
	Alternative method 2		
	120 000 ÷ $\frac{\text{their 2}}{\text{their 7}}$ or 120 000 ÷ $\frac{\text{their 1}}{\text{their 3.5}}$	M1	where fraction in (a) is of the form $\frac{m}{n}$, $m > 1$ where fraction in (a) is of the form $\frac{1}{n}$
	420 000	A1ft	ft their answer from part (a)

Q	Answer	Mark	Comments
13	0.1 × 32 or 3.2(0)	M1	oe 0.9 × 32 or 28.8(0) scores M2
	32 – their 3.2(0) or 28.8(0)	M1dep	
	2000 ÷ their 28.8(0) or 69.(44...)	M1	Condone their 28.8 being 32
	2000 ÷ 28.5(0) or 70.(17...) or 28.5 × 70 = 1995	M1	
	69 and 70 seen and 70 chosen	A1	
14	$4x + 20 = 15$ or $x + 5 = 15 \div 4$	M1	oe
	$4x = 15$ – their 20 or $x = 15 \div 4 - 5$	M1	oe
	–1.25	A1ft	oe ft M1M0 or M0M1 with only one error
15	**Alternative Method 1**		
	90 ÷ 40 or 2.25 or 356 ÷ 40 or 8.9	M1	oe
	801	A1	
	Alternative Method 2		
	40 + 40 + 10 and 356 ÷ 4 or 89	M1	Clear build up method
	801	A1	

Q	Answer	Mark	Comments
16	24 + 45 + 281 + 50 or 400	M1	
	0.18 × their 400 or 72	M1	oe
	their 72 – 45 or 27	M1	
	23	A1	
17	2 × 14 + 10 × 15 + 2 × 16 + 3 × 17 + 13 × 18 or 28 + 150 + 32 + 51 + 234 or 495	M1	Allow one error or omission
	(2 × 14 + 10 × 15 + 2 × 16 + 3 × 17 + 13 × 18) ÷ 30 or 16.5	M1dep	Condone bracket error
	14	A1	Full method required
18	10 000	B1	
19	$\begin{pmatrix} 7 \\ -5 \end{pmatrix}$	B1	
20	0.667	B1	
21	Ticks 'False' and states that x could be –4	B1	oe

Q	Answer	Mark	Comments
22	**Alternative method 1**		
	6.31 – 3.6(0) or 2.71	M1	
	their 2.71 ÷ 3.6(0) (× 100) or 0.752(7…) or 0.753	M1dep	
	75.2(7…) or 75.28 or 75.3	A1	Allow 75 with correct method seen
	Alternative method 2		
	6.31 ÷ 3.6(0) (× 100) or 1.752(7…) or 1.753 or 175.2(7…) or 175.3	M1	
	1.752(7…) – 1 or 1.753 – 1 or 175.2(7…) – 100 or 175.3 – 100	M1dep	
	75.2(7…) or 75.28 or 75.3	A1	Allow 75 with correct method seen
23	One continuous arc, centre *A*, intersecting *AB* and *AD* or Two arcs, each with same radius and centre *A,* intersecting *AB and AD*	M1	Allow ± 2 mm for radii
	Intersecting arcs with same radius and centres at the intersections with *AB* and *AD* and angle bisector drawn	A1	Allow ± 2 mm for radii The radius of these arcs need not be the same as those used for M1
	Arc of radius [5.8, 6.2] cm, centre *C,* intersecting their angle bisector and *P* labelled  	B1ft	SC1 Arc of radius [5.8, 6.2] cm, centre *C* with no angle bisector attempted

Q	Answer	Mark	Comments
24(a)	375.112(1656)	B1	Condone if correctly rounded to 7 significant figures or better eg 375.1122
24(b)	20^2 or 400 or $\sqrt[3]{1000}$ or 10 or 5	M1	
	400 – 10 ÷ 5 = 398 or 400 – 2 = 398	A1	
25	C and three correct comparable values eg 12(%) 12.5(%) 12.75(%)) 0.12 0.125 0.1275 $\frac{48}{400}$ $\frac{50}{400}$ $\frac{51}{400}$ 1 : 7.3... 1 : 7 1 : 6.8... (3 : 22) 3 : 21 3 : 20.5...	B3	B2 for two correct conversions to same comparable form B1 for one correct conversion to another form eg **A** $\frac{3}{25}$ oe or 12(%) or 0.12 **B** 1 : 7 oe or 12.5(%) or 0.125 **C** $\frac{51}{400}$ oe or 51 : 349 oe or 0.1275
26	D	B1	

Q	Answer	Mark	Comments
27	$9 + 3x + x - 5 + 2x$ or $6x + 4$ or $3x + x - 5 + 2x$ or $6x - 5$	M1	oe
	their $(6x + 4) = 100$ or their $6x - 5 = 91$ or $6x = 96$	M1	oe $\frac{9}{\text{their } (6x + 4)} = \frac{9}{100}$
	$x = 16$	A1	
	$\frac{11}{100}$	B1ft	ft their 16
28	100(%) – 14(%) or 86(%) or 1 – 0.14 or 0.86	M1	Implied by 87 139(.5)
	$101\,325 \times 0.86^4$	A1	oe eg 101 325 × 0.86 or 87 139(.5) and their 87 139(.5) × 0.86 or 74 939(.97) and their 74 939(.97) × 0.86 or 64 448(.3742) and their 64 448(.3742) × 0.86
	55 425(...)	A1	May be implied by 55 000 or 55 400 or 55 430 or 55 426
	55 000	B1ft	ft their answer rounded to 2sf

Q	Answer	Mark	Comments
29	**Alternative method 1**		
	$\angle PCB = 180 - 90 - 15$ or $75°$ or $\angle PCB = 90 - 15$	M1	oe Angle may be seen on diagram
	$\angle ABC = \angle PCB =$ their 75 and $\angle BCD = 180 -$ their 75 or $105°$	M1	oe Angle may be seen on diagram
	$x = 105 - 75 = 30°$	A1	Full method required
	Alternative method 2		
	$\angle PCB = 180 - 90 - 15$ or $75°$ or $\angle PCB = 90 - 15$	M1	oe Angle may be seen on diagram
	$\angle ABC = \angle PCB =$ their 75 and $\angle ABP =$ their $75 - 15$ or $60°$ and $\angle BAC = 180 - 90 -$ their 60	M1	oe Angles may be seen on diagram
	$x = \angle BAC = 30°$	A1	Full method required
	Alternative method 3		
	$\angle PCB = 180 - 90 - 15$ or $75°$ or $\angle PCB = 90 - 15$	M1	oe Angle may be seen on diagram
	$\angle ABC = \angle PCB =$ their 75 and $\angle BAC = 180 -$ their $75 -$ their 75	M1	oe Angle may be seen on diagram
	$x = \angle BAC = 30°$	A1	Full method required

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